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PRINCIPAL INVESTIGATOR: Henry J. Thompson, Ph.D.

CONTRACTING ORGANIZATION: AMC Cancer Research Center
Denver, Colorado 80214

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6. AUTHOR(S):
Henry J. Thompson, Ph.D.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
AMC Cancer Research Center
Denver, Colorado 80214

E-MAIL:
thompsonh@amc.org

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13. ABSTRACT ***(Maximum 200 Words)***

The purpose of this project is to evaluate the effect(s) of increasing fruit and vegetable intake on oxidative DNA damage and lipid peroxidation in a population of women at elevated risk for breast cancer. The rationale that underlies the work proposed is based on evidence that the occurrence of DNA mutations are essential steps in carcinogenesis and that these mutagenic events can result from oxidative stress, even in the absence of exogenous carcinogens. The effects of consuming a recipe-defined diet designed to provide three (control) or ten (intervention) servings of fruits and vegetables per day for a total of 8 weeks on measures of oxidative damage to DNA and lipids is being determined. During this reporting period, the accrual goal of enrolling 200 subjects in this project was exceeded. A total of 213 individuals completed the dietary intervention. Sample analysis is complete and of data evaluation is now ongoing and will be finished during the one-year no cost extension of this project.

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Introduction

The objective of this research project is to determine the effect(s) of increasing fruit and vegetable intake on oxidative DNA base damage and lipid peroxidation in a population of women at elevated risk for breast cancer. The rationale that underlies the work proposed is based on evidence that the occurrence of DNA mutations are essential steps in carcinogenesis and that these mutagenic events can result from oxidative stress, even in the absence of exogenous carcinogens. The effects of consuming a recipe-defined diet designed to provide three (control) or ten (intervention) servings of fruits and vegetables per day for a total of 8 weeks on measures of oxidative damage to DNA and lipids is being determined. Urine and blood components are being assessed for oxidative endpoints and plasma is being evaluated for biochemical markers of edible plant consumption.

Body

Approved Statement of Work

To test whether an increase in consumption of fruits and vegetables will decrease indicators of oxidative cellular damage in women at high risk for breast cancer occurrence or reoccurrence.

The activities required to complete the work statement were:

a. Initiate recruitment 2 months prior to initiation of a study group into the investigation.
b. Conduct the 8 week intervention in a total of 2 study groups (50 subjects, 25/group).
c. Perform laboratory analyses
d. Repeat steps a-c an additional three times (Years 1-3). We anticipate that recruitment will be completed during year three, and that laboratory and statistical analyses will continue throughout the project.
e. Summarize results and write reports and manuscripts (Years 1-3).

Project Implementation

Introduction As noted in the original application, this project was based on pilot work in which we studied the effects of a two-week recipe defined diet on oxidative markers. Upon commencement of work on this project, a multi-pronged plan of attack was implemented. Its elements included: 1) modification of the recipe-defined menus for use in an 8-week intervention study; 2) development and testing of intervention materials; and 3) further evaluation of the candidate oxidative markers. As reported in the First Annual Report, significant progress was made and recruitment was initiated. Effort during the remainder of the project was focused on recruitment, conducting the intervention, and the evaluation of the dietary records and biological specimens that were obtained.

Scheduling In order to maximize the likelihood of high dietary compliance, it was deemed very desirable to avoid major secular and denominational holidays during the course of the dietary intervention. Avoidance of July and August was also deemed desirable because of participant vacation schedules. During the calendar year, three blocks of time were identified as being most desirable and were targeted for recruitment efforts. Interventions were conducted during each of these time intervals during years 2 and 3 of the project.

Recruitment As might be anticipated, subject recruitment was a key aspect of this project and required an exceeding amount of effort to be successful. A total of 271 interested and eligible subjects were identified and enrolled in the project. Of these individuals, 213 completed the dietary intervention.

Dropouts *Fifty-eight* individuals who gave informed consent dropped out of the study. Reasons for dropping out were categorized into three major categories: time constraints (e.g. work conflicts or insufficient time to prepare meals as required), 45%; unable to follow the diet (e.g. couldn't adjust to following a prescribed diet for an extended period of time, or didn't like the menus) 37%; and illness not related to the study (e.g. contracting flu or a severe cold), 18%. One individual who dropped was contacted for follow-up, but never returned phone calls or correspondence.

Adverse events No major or minor adverse events have been noted during the course of the project.

Sample evaluation/Statistical analyses All proposed biochemical analyses are complete and all dietary records have been entered into the NDS nutrient analysis system. Statistical analyses of all data from biological samples and dietary records are ongoing and will be completed during the one year no cost extension of this project.

Key Research Accomplishments

- A total of 213 completed the proposed dietary intervention. Thus our accrual goal was achieved.
- Biological samples have been chemically evaluated and all dietary record data have been entered into a nutrient analysis program.

Reportable Outcomes (cumulative)

- Cookbooks were developed and tested .
- Supporting intervention materials were developed and tested.
- An alternative method of analysis of a urinary product of DNA oxidation was identified.
- Assessment of serum protein oxidation was shown to be feasible.

Conclusions A one-year no cost extension of this project is in effect. By the end of this extension all goals of the project will have been achieved, and manuscripts written and submitted for publication. The final report will be submitted in August 2003.

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